1989 U.S. User Survey Results

Robert L. Goodwin
Vice President
INPUT

INPUT

1989 User Surveys

- Large systems
- Mid-range systems
- PC/workstations
- Third-party maintenance

INPUT

Notes

INPUT

1989 INPUT Research Base

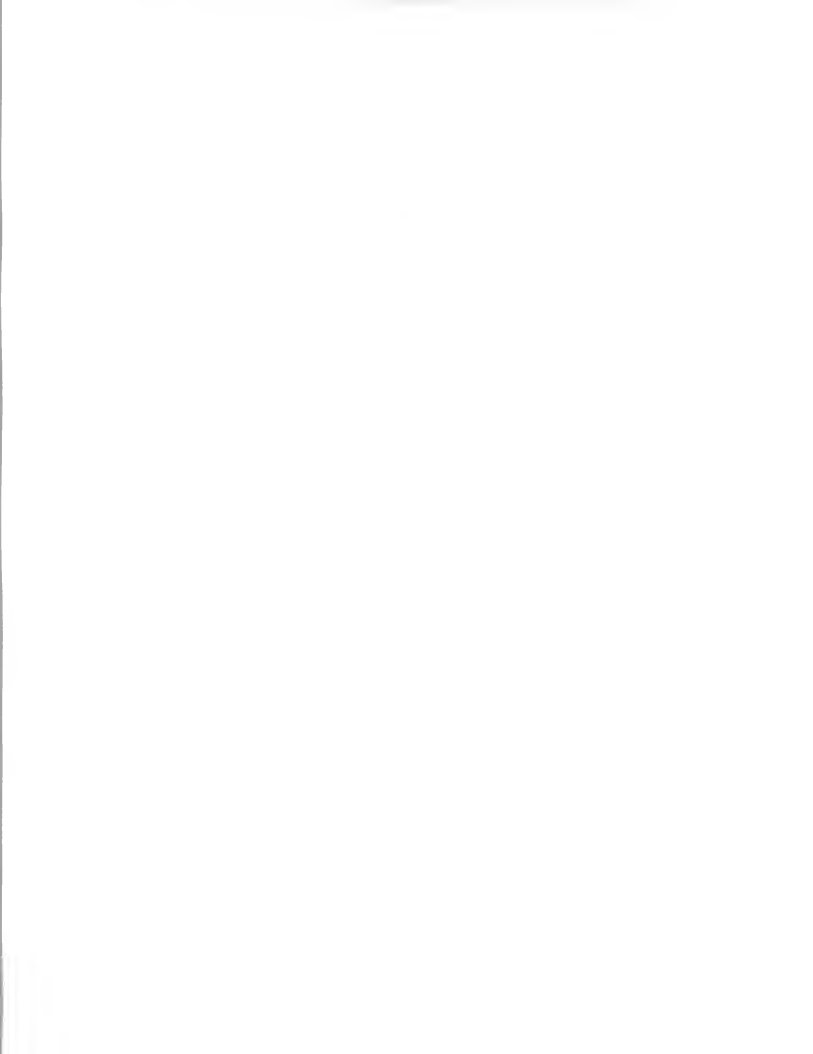| User Research	No. of Surveys
Large system users	374
Mid-range system users	399
PC/workstation users	178
TPM users	184
Total users	1,135

INPUT

Notes

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User Surveys

- Large systems

INPUT

FSEM-BG-3

INPUT

Service Vendor Selection Criteria
Large Systems

Criteria	Importance
Service quality	9.3
System availability	9.2
Technical expertise	8.9
Response time	8.7
Access to spares	8.4

Importance →

INPUT

Notes

FSEM-BG-4

INPUT

Service Vendor Selection Criteria
Large Systems

Criteria	Importance
Software support	7.5
Vendor reputation	7.5
Price	6.8
Contract flexibility	6.7
Ability to service other products	4.3

INPUT

Notes

FSEM-BG-5

INPUT

Service Contract Coverage
All Large Systems

Contract Component	Sample Responding (Percent)	
	1988	1989
• Days of coverage		
- Monday - Friday	46	45
- Monday - Saturday	2	1
- Monday - Sunday	52	54

INPUT

Notes

INPUT

Service Contract Coverage
All Large Systems

Contract Component	Sample Responding (Percent)	
	1988	1989
• Hours of coverage		
- 1 to 9 hours	34	41
- 10 to 16 hours	11	6
- 17 to 24 hours	55	53

INPUT

Notes

FSEM-BG-7

INPUT

System Availability Analysis
All Large Systems

Performance Criteria	Received	Percent Satisfied
System availability (%)	97.9	67
Response time (hrs.)	2.0	88
Repair time (hrs.)	2.5	86

INPUT

Notes

INPUT

Large Systems System Availability
1983-1989

INPUT

Notes

System Availability Satisfaction at Each Requirement Level

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INPUT

System Interruption
Analysis—All Large Systems

• System Interruptions (Per month)	.9
	Percent
- Hardware-caused	63
- System software-caused	16
- Application software-caused	5
- Other-caused	16

INPUT

Notes

INPUT

Large Systems User Needs Still Unmet

A = Parts Availability
B = HW Eng. Skill
C = Overall HW Support
D = SW Documentation
E = SW Eng. Skill Level
F = Overall SW Support

INPUT

Large Systems User Satisfaction with High-Priority Services

Dissatisfied	Satisfied	
Most Users Satisfied	HW Eng. Skill Level	65
	HW Support Overall	66
	Parts Availability	53
	SW Eng. Skill	53
	SW Support Overall	51

100 75 50 25 0 25 50 75 100
Percent of Users

INPUT

Notes

INPUT

Large Systems User Satisfaction with High-Priority Services

Dissatisfied	Satisfied
Most Users Dissatisfied	

63 SW Documentation

51 SW Remote Support

100 75 50 25 0 25 50 75 100

Percent of Users

Notes

System Availability Performance—Large Systems

Vendor	Sys. Avail. Received (Percent)	Percent Satisfied
IBM 308X	98.8	87
CDC	97.4	80
Bull H.N.	98.5	73
IBM 309X	98.7	72
NAS	98.3	68

Percent Satisfied

INPUT

Notes

INPUT

System Availability Performance—Large Systems

Vendor	Sys. Avail. Received (Percent)	Percent Satisfied
Unisys 1100/XX	96.9	68
Unisys A-Series	96.2	59
NCR	96.8	53
Amdahl	99.2	49

Notes

FSEM-BG-16

INPUT

Response Time Performance
Large Systems

Vendor	Resp. Time Received (Percent)	Percent Satisfied
IBM 309X	1.0	100
IBM 308X	.9	100
Amdahl	1.1	90
CDC	2.4	90
Bull H.N.	1.4	89

Percent Satisfied: 0 — 50 — 100

INPUT

Notes

INPUT

Response Time Performance
Large Systems

Vendor	Resp. Time Received (Percent)	Percent Satisfied
NAS	1.2	89
Unisys A-Series	1.9	85
Unisys 1100/XX	1.4	83
NCR	6.7	67

INPUT

FSEM-BG-18

INPUT

Repair Time Performance
Large Systems

Vendor	Repr. Time Received (Percent)	Percent Satisfied
Amdahl	1.7	94
IBM 308X	2.1	94
IBM 309X	2.3	91
Bull H.N.	2.7	89
CDC	4.1	86

Percent Satisfied: 0   50   100

INPUT

Notes

Repair Time Performance
Large Systems

Vendor	Repr. Time Received (Percent)	Percent Satisfied
Unisys A-Series	2.3	85
Unisys 1100/XX	2.2	85
NAS	1.7	85
NCR	3.6	74

Percent Satisfied

INPUT

Notes

INPUT

User Surveys

Mid-Range Systems

Notes

INPUT

Service Vendor Selection Criteria
Mid-Range Systems

Criteria	Importance
Service quality	9.1
System availability	9.1
Technical expertise	8.8
Response time	8.5
Access to spares	8.4

Notes

FSEM-BG-22

INPUT

Service Vendor Selection Criteria
Mid-Range Systems

Criteria	Importance
Software support	7.5
Vendor reputation	7.5
Price	6.2
Contract flexibility	6.2
Ability to service other products	4.3

INPUT

INPUT

Service Contract Coverage
All Mid-Range Systems

Contract Component	Sample Responding (Percent)	
	1988	1989
• Days of coverage		
- Monday - Friday	66	64
- Monday - Saturday	4	3
- Monday - Sunday	30	33

INPUT

Notes

INPUT

Service Contract Coverage
All Mid-Range Systems

Contract Component	Sample Responding (Percent)	
	1988	1989
• Hours of coverage		
- 1 to 9 hours	54	56
- 10 to 16 hours	14	13
- 17 to 24 hours	32	31

INPUT

Notes

INPUT

System Availability Analysis
All Mid-Range Systems

Performance Criteria	Received	Percent Satisfied
System availability (%)	97.4	56
Response time (hrs.)	3.9	90
Repair time (hrs.)	4.0	91

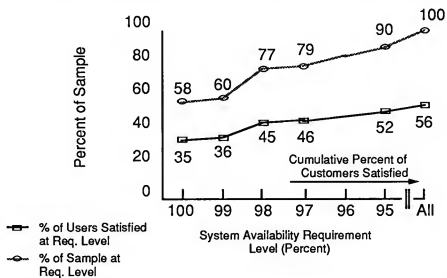Percent Satisfied

INPUT

INPUT

Mid-Range Systems System Availability 1983-1989

System Availability Satisfaction at Each Requirement Level—All Mid-Range Systems

System Interruption Analysis
All Mid-Range Systems

System Interruptions (Per month)	.59
	Percent
Hardware-caused	63
System software-caused	13
Application software-caused	4
Other-caused	20

INPUT

Notes

INPUT

Key Service Requirements vs. Received
All Mid-Range Systems

A = HW Maintenance   D = Spare Parts Availability
B = SW Support   E = SW Remote Support
C = HW Remote Support F = SW Documentation

Notes

INPUT

Mid-Range Systems User Satisfaction
with High-Priority Services

Dissatisfied	Satisfied

Most Users Satisfied

HW Remote Support 63

HW Maint. Overall 59

SW Eng. Skill 57

100 75 50 25 0 25 50 75 100

Percent of Users

INPUT

INPUT

Notes

Mid-Range System User Satisfaction with High-Priority Services

Dissatisfied	Satisfied

Most Users Satisfied

SW Remote Support 55

Spares Availability 54

HW Eng. Skill 54

SW Support Overall 51

100 75 50 25 0 25 50 75 100

Percent of Users

INPUT

Notes

INPUT

Mid-Range System User Satisfaction with High-Priority Services

Dissatisfied	Satisfied
Most Users Dissatisfied	

53 | SW Documentation

100 75 50 25 0 25 50 75 100

Percent of Users

INPUT

Notes

INPUT

System Availability Performance
Mid-Range Systems

Vendor	Sys. Avail. Received (Percent)	Percent Satisfied
IBM 937X	97.5	74
Concurrent	97.8	73
Data General	96.7	73
Prime	97.4	68
IBM AS 400	98.0	67

Percent Satisfied

INPUT

Notes

FSEM-BG-34

INPUT

System Availability Performance
Mid-Range Systems

Vendor	Sys. Avail. Received (Percent)	Percent Satisfied
HP	96.9	65
AT&T	95.9	59
Tandem	99.0	43
DEC	97.1	39
Wang	98.4	3

Notes

FSEM-BG-35

INPUT

Response Time Performance
Mid-Range Systems

Vendor	Resp. Time Received (Percent)	Percent Satisfied
Tandem	1.6	100
HP	4.1	95
Data General	7.1	92
Wang	1.9	92
Concurrent	5.3	90

INPUT

Notes

FSEM-BG-36

INPUT

Response Time Performance
Mid-Range Systems

Vendor	Resp. Time Received (Percent)		
IBM AS 400	1.0		89
IBM 937X	1.7		89
AT&T	11.3		85
DEC	2.1		85
Prime	2.2		83

0   50   100
Percent Satisfied

INPUT

Notes

FSEM-BG-37

INPUT

Repair Time Performance
Mid-Range Systems

Vendor	Repr. Time Received (Percent)	Percent Satisfied
Data General	4.1	97
Tandem	2.8	97
Wang	1.6	97
IBM AS 400	2.7	94
IBM 937X	2.9	93

Percent Satisfied

INPUT

Notes

INPUT

Repair Time Performance
Mid-Range Systems

Vendor	Repr. Time Received (Percent)	Percent Satisfied
DEC	3.6	90
HP	1.9	88
Concurrent	8.4	84
AT&T	9.0	83
Prime	2.9	68

Percent Satisfied

INPUT

Notes

INPUT

User Surveys

Third-Party Maintenance

Notes

Service Vendor Selection Criteria
Third-Party Maintainers

	Importance
Service quality	9.2
Technical expertise	8.7
System availability	8.6
Response time	8.3
Access to spares	8.1

INPUT

Notes

FSEM-BG-41

INPUT

Service Vendor Selection Criteria
Third-Party Maintainers

Criteria	Importance
Price	7.8
Vendor reputation	7.6
Contract flexibility	6.0
Ability to service other products	5.9
Software support	4.5

INPUT

Notes

INPUT

TPM Contract Coverage
All Users

Service Coverage	Sample (Percent)	
	1988	1989
• Days of Coverage		
Monday - Friday	71	64
Monday - Saturday	4	2
Monday - Sunday	25	34

INPUT

Notes

INPUT

TPM Contract Coverage
All Users

Service Coverage	Sample (Percent)	
	1988	1989
• Hours of Coverage		
1 - 9 hours	62	53
10 - 16 hours	9	12
17 - 24 hours	29	35

INPUT

Notes

INPUT

TPM System Availability Analysis
All Users

Component	Require	Receive	
System availability (%)	94.4	95.9	67
Response time (hrs.)	5.0	3.9	91
Repair time (hrs.)	7.8	6.1	81

Percent Satisfied

INPUT

Notes

FSEM-BG-45

INPUT

TPM System Availability Satisfaction at Each Requirement Level—All Users

Notes

INPUT

TPM System Interruption Analysis—All Users

System Interruptions (per month)	1.2

	Percent
Hardware-caused	66
System software-caused	9
Applications software-caused	5
Other (i.e., user-caused)	20

INPUT

INPUT

TPM Hardware Maintenance Required
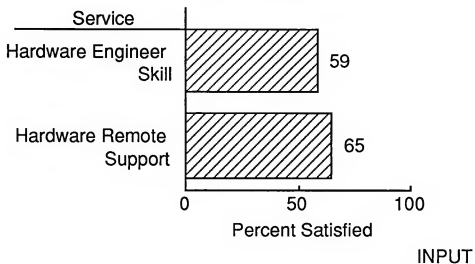vs. Received—All Users

Requirement

Dissatisfied

A ■ C ■ D

Satisfied

Received

A = Hardware Engineer Skill   C = Spare Parts Availability
B = Hardware Remote Support   D = Overall Hardware Maintenance

INPUT

Notes

FSEM-BG-48

INPUT

TPM Hardware Maintenance
Satisfaction—All Users

Service

Hardware Engineer Skill — 59

Hardware Remote Support — 65

Percent Satisfied

INPUT

Notes

INPUT

TPM Hardware Maintenance
Satisfaction—All Users

INPUT

TPM Versus Manufacturer System Availability Performance

Vendor Type	(Percent)	
	Req.	Rec.
TPM	97.3	99.0
MFR	97.8	97.9
TPM	94.7	95.5
MFR	97.4	97.3
TPM	92.5	96.4
MFR	94.0	95.7

Values (Percent Satisfied):
- TPM (PC/WS): 85
- MFR (PC/WS): 67
- TPM (Mid-Range): 62
- MFR (Mid-Range): 59
- TPM (Large): 77
- MFR (Large): 73

Scale: 0 20 40 60 80 100
Percent Satisfied

- □ PC/WS
- ▣ Mid-Range System
- ▨ Large System

INPUT

Notes

INPUT

User Satisfaction With Hardware
Maintenance—TPM Versus Manufacturer

Product Type

Large Systems — TPM 78, Manufacturer 76
Small Systems — TPM 65, Manufacturer 54
PC/WS — TPM 68, Manufacturer 59

■ TPM
▨ Manufacturer

Percent Satisfied (0, 20, 40, 60, 80, 100)

INPUT

Notes

INPUT

User Satisfaction with Parts Availability
TPM Versus Manufacturer

Product Type	Percent Satisfied
Large System	TPM: 56, Manufacturer: 60
Small System	TPM: 49, Manufacturer: 46
PC/WS	TPM: 67, Manufacturer: 73

■ TPM
▨ Manufacturer

INPUT

Notes

INPUT

User Surveys

PC/Workstations

Notes

Service Vendor Selection Criteria
PC/Workstation

Criterion	Importance
Technical expertise	8.4
System availability	8.1
Response time	8.0
Access to spares	8.0
Vendor reputation	7.5

Importance

INPUT

Notes

INPUT

Service Vendor Selection Criteria
PC/Workstation

Criteria	Importance
Price	6.9
Service quality	6.6
Contract flexibility	6.5
Software support	5.9
Ability to service other products	5.4

Importance

INPUT

Notes

FSEM-BG-56

INPUT

Service Contract Coverage
PC/Workstations

Days Covered	Percent of Sample — 1989
Monday - Friday	76
Monday - Saturday	1
Monday - Sunday	23

INPUT

Notes

FSEM-BG-57

INPUT

Service Contract Coverage
PC/Workstations

Hours Covered	Percent of Sample —1989
1 - 9	75
10 - 16	4
17 - 24	21

INPUT

Notes

INPUT

System Availability Analysis
PC/Workstations

Performance Criteria	Received	Percent Satisfied
System availability (%)	95.0	71
On-site response time (hrs.)	9.4	62
On-site repair time (hrs.)	7.0	69
Depot turnaround time (days)	3.8	71

INPUT

Notes

INPUT

System Availability Performance Analysis PC/Workstations

	MFC	Dealers	TPM
System availability (%)	95.7	95.0	94.5
Response time (hrs.)	11.3	11.1	7.1
Repair time (hrs.)	6.9	3.9	8.9
Depot turnaround (days)	4.6	2.2	3.3

INPUT

Notes

INPUT

Satisfaction Levels—PC/Workstations

Category	TPM	Dealer	MFC
System availability	74	61	73
Response time	61	76	53
Repair time	68	72	67
HW maintenance overall	68	73	59

Percent Satisfied

INPUT

Notes

FSEM-BG-61

INPUT

System Availability Satisfaction at Each Requirement Level—PC/Workstations

INPUT

System Interruption Analysis
PC/Workstations

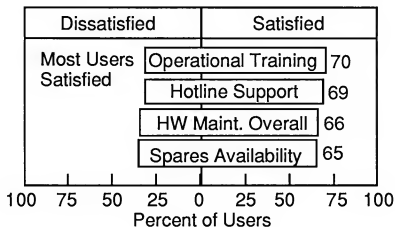|	Mean (1989)
System interruptions per month	1.3
Hardware-caused	77.0
System software-caused	8.0
Application software-caused	5.0
Other-caused	10.0

INPUT

Notes

FSEM-BG-63

INPUT

PC/Workstation User Satisfaction
with High-Priority Services

Dissatisfied	Satisfied	
Most Users Satisfied	Operational Training	70
	Hotline Support	69
	HW Maint. Overall	66
	Spares Availability	65

100 75 50 25 0 25 50 75 100
Percent of Users

INPUT

Notes

INPUT

PC/Workstation User Satisfaction
with High-Priority Services

Dissatisfied	Satisfied

Most Users Satisfied

HW Eng. Skill 64

SW Remote Support 52

100 75 50 25 0 25 50 75 100
Percent of Users

INPUT

Notes

PC/Workstation User Satisfaction with High-Priority Services

Dissatisfied	Satisfied
Most Users Dissatisfied	

52 SW Documentation
51 SW Eng. Skill
51 SW Support Overall

100 75 50 25 0 25 50 75 100

Percent of Users

INPUT

Notes

INPUT

System Availability Performance
PC/Workstations

Vendor	Sys. Avail. Received (Percent)	
Apollo (HP)	96.2	80
Tandy	94.4	75
IBM	93.7	73
ALTOS	93.0	70

Percent Satisfied

INPUT

Notes

INPUT

System Availability Performance PC/Workstations

Vendor	Sys. Avail. Received (Percent)	Percent Satisfied
Compaq	97.0	68
Apple	94.6	68
Sun	96.0	60

Percent Satisfied

INPUT
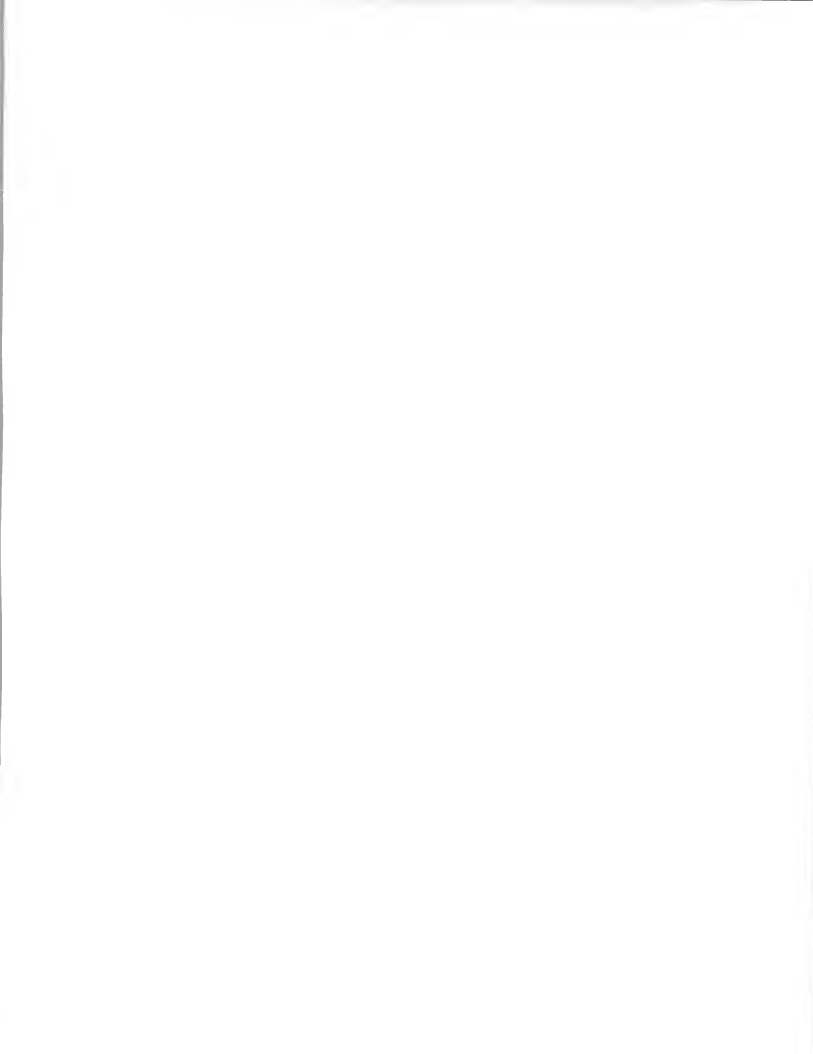
INPUT

Robert L. Goodwin
Vice President
Western Operation

PROFILE

CAPABILITIES

- Twenty-five years successful sales, marketing, and general management in the computer equipment, remote processing services and software industries.

- Expertise in business plan development, strategic partnering and acquisitions, industry marketing, VAR and reseller operations.

BACKGROUND

- Robert (Bob) Goodwin brings to INPUT and its clients comprehensive experience in executive management in large and mid-size corporations.

- Most recently he has served as President of COMMAND DATA SYSTEMS, a public safety software and turnkey systems vendor. With Bob's leadership and marketing strategy, CDS became a highly visible and respected vertical market leader.

- Bob's qualifications include the role of Director of Marketing for Xerox Computer Services, in support of all field sales and customer services activities.

- IBM utilized Bob's skills as Branch Manager and Assistant District Manager.

EDUCATION

- B.A., Psychology, Occidental College.

- Attended the MBA program, Golden Gate University.

TITLE

Bob Goodwin

10/16/89

TO: Andrea Jeris
    INPUT
    MT View

From: Buddy Stigler

Attached are the pages for the
slide presentation that Bob Goodwin
will make on the 2nd day of
my conference—

I tried to use existing slide formats
where possible to simplify the production
process, There are 69 slides in the presentation.

        Thanks!!!
    Buddy

1989

User Surveys

- Large Systems
- ~~Small~~ Systems   *MidiRange*
- *PC/Workstations*
- Third Party Maintenance

NOTES:

1989 ~~1988~~ INPUT Research Base

User Research	No. of Surveys	
Large System Users	~~381~~	374
Mid-range ~~Small~~ System Users	~~399~~	399
Pc/workstation USERS		178
TPM Users	~~200~~	184
Total Users	~~980~~	1135

NOTES:

FPRB-22a

USER SURVEYS

- Large Systems

Input

Notes:

SERVICE VENDOR SELECTION CRITERIA
LARGE Systems

Criteria	Importance
SERVICE Quality	9.3
Systems Availability	9.2
Technical Expertise	8.9
Response Time	8.7
Access to Spares	8.4

Importance

SERVICE VENDOR SELECTION CRITERIA
LARGE Systems

Criteria	Importance
software Support	7.5
Vendor Reputation	7.5
Price	6.8
Contract Flexibility	6.7
Ability to Service Other Products	4.3

Scale: 2 4 6 8 10

Importance

6

6

Service Contract Coverage
All Large-Systems

Contract Component	Sample Responding (Percent)	
	1988	1989
• Days of coverage		
- Monday – Friday	46	45
- Monday – Saturday	2	1
- Monday – Sunday	52	54

INPUT

NOTES:

FPRB-23a

INPUT

Service Contract Coverage
All Large-Systems

Contract Component	Sample Responding (Percent)		
	1987	1988	1989
• Hours of coverage			
- 1 to 9 hours		34	41
- 10 to 16 hours		11	6
- 17 to 24 hours		55	53

INPUT

NOTES:

FPRB-23b

INPUT

Large Systems System Availability
1983-1988

Chart showing System Availability (Percent) versus Year (1983–1989). Data points: 97.0, 96.8 (1983); 96.7, 96.5 (1984); 97.5, 97.3 (1985); 98.3, 98.1 (1986); 98.3, 97.6 (1987); 98.3, 97.9 (1988); handwritten 97.9, 97.8 and "1989". Legend: Achieved ----, Required ——. INPUT

NOTES:

FPRB-25

Availability
...ction Increases

In 1989, large-system users reported that they received system availability of 97.9% versus an expressed requirement of 97.8%. As stated in the previous section, user requirements for system availability dropped in 1989 (from 98.3% in 1988 to 97.8% in 1989), contributing to increased satisfaction with system availability in 1989, with 67% of the large-systems sample satisfied with system availability (up from 62% in 1988).

Exhibit II-3 presents the percentage of users who require system availability at each requirement level, as well as the cumulative percentage of users who are satisfied at each requirement level. For example, 36% of the 1989 large-systems users surveyed reported that they require 100% system availability. Of those users, the large-systems vendors were able to satisfy 29%. Sixty-two percent of the users require 99% system availability or better, and large-systems vendors were able to satisfy 50% of those users.

EXHIBIT II-3

SYSTEM AVAILABILITY SATISFACTION AT EACH REQUIREMENT LEVEL

Percent of Sample (y-axis: 0, 25, 50, 75, 100)

Percent of Sample at Requirement Level: 36, 47, 62, 65, 80, 81, 82, 100
Percent of Users Satisfied at the Requirement Level: 29, 39, 50, 52, 60, 60, 61, 67

Cumulative Percent of Customers Satisfied

System Availability Requirement Level (Percent): 100, 99, 98, 97, All

-□- Percent of Sample at Requirement Level
-◆- Percent of Users Satisfied at the Requirement Level

System Interruption
Analysis—All Large Systems

- Systems Interruptions | ~~16~~ , 9
  (per month)

	Percent	
- Hardware caused	~~49~~	63
- System Software caused	~~21~~	16
- Application Software caused	~~11~~	5
- Other caused	19	16

INPUT

NOTES:

FPRB-27

INPUT

Large-Systems User Needs Still Unmet

Satisfied

Vital Service Needs Unmet

Dissatisfied

Value

A=Parts Availability
B=Hardware Engineering Skill Level
C=Overall Hardware Support
D=Software Documentation
E=Software Engineering Skill Level
F=Overall Software Support

INPUT

NOTES: Replot above for 1989

		Required	Received
A	Parts Avail	8.9	8.8
B	HW Eng Skill	9.0	8.5
C	Overall HW support	9.1	8.6
D	SW Documentation	8.4	6.8
E	SW Eng Skill Level	8.8	7.9
F	Overall SW Support	8.6	7.8

FPRB-28

INPUT

13

Large System User Satisfaction
with High-Priority Services

Dissatisfied	Satisfied
Most Users Satisfied	HW Eng. Skill Level ~~50~~ 65
	HW Support Overall ~~53~~ 66

100 75 50 25 0 25 50 75 100

Percent of Users

NOTES:

Add to Above

Parts Availability 53~~8~~

SW Eng Skill 53

SW support overall 51

(Satisfied)

FPRB-29a

14

Large System User Satisfaction with High-Priority Services

Dissatisfied		Satisfied
Most Users Dissatisfied	54 Software Eng. Skill Level	
	55 Parts Availability	
	57 Software Support Overall	
63 75 Software Documentation		

100 75 50 25 0 25 50 75 100
Percent of Users

INPUT

NOTES: add to above

SW Remote Support   51 dissatisfied

FPRB-29b

INPUT

Systems Availability Performance—Large Systems

Vendor	Sys. Avail. Received (Percent)	Percent Satisfied
NAS	99.0	85
Amdahl	98.2	78
NCR	97.1	61
IBM 309X	98.1	58
IBM 308X	98.6	58

INPUT

NOTES:	Received	%
IBM 308X	98.8	87
CDC	97.4	80
Bull H.N.	98.5	73
IBM 309X	98.7	72
NAS	983	68

FPRB-31

INPUT

Systems Availability Performance—
Large Systems

Vendor	Sys. Avail. Received (Percent)	Percent Satisfied
UNISYS (Sperry)	97.4	57
UNISYS (Burroughs)	97.5	56
CDC	97.5	53
Honeywell	97.1	49

INPUT

update

NOTES:

UNISYS 1100/xx	96.9	68
UNISYS A-series	96.2	59
NCR	96.8	53
Amdahl	99.2	49

FPRB-32

INPUT

Response Time Performance— Large Systems

Vendor	Resp. Time Received (Percent)	Percent Satisfied	
IBM 309X	1.5		100
Amdahl	1.4		97
CDC	3.1		97
IBM 308X	1.3		97
Honeywell	1.4		92

INPUT

NOTES:

	Received	%
IBM 309X	1.0	100
IBM 308X	.9	100
Amdahl	1.1	90
CDC	2.4	90
Bull H.N	1.4	89

FPRB-33

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18

Response Time Performance— Large Systems

Vendor	Resp. Time Received (Percent)	Percent Satisfied
NAS	1.5	91
NCR	2.0	91
UNISYS (Burroughs)	1.6	88
UNISYS (Sperry)	1.5	79

INPUT

NOTES:

Received %

	Received	%
NAS	1.2	89
UNISYS A-Series	1.9	85
UNISYS 1100/XX	1.4	83
NCR	6.7	67

FPRB-34

INPUT

Repair Time Performance— Large Systems

Vendor	Repr. Time Received (Hours)	Percent Satisfied
UNISYS (Burroughs)	7.1	100
IBM 309X	2.9	96
CDC	8.8	91
NAS	1.9	90

INPUT

NOTES:

	Received	%
Amdahl	1.7	94
IBM 308X	2.1	94
IBM 309X	2.3	91
Bull H.N.	2.7	89
CDC	4.1	86

FPRB-35

INPUT

Repair Time Performance— Large Systems

Vendor	Repr. Time Received (Hours)	Percent Satisfied
Amdahl	1.7	88
IBM 308X	2.3	86
Honeywell	4.1	85
NCR	3.0	75
UNISYS (Sperry)	5.6	69

INPUT

NOTES:

	Received	%
UNISYS A-series	2.3	85
UNISYS 1100/XX	2.2	85
NAS	1.7	85
NCR	3.6	74

FPRB-36

INPUT

User Surveys

Mid-Range ~~Small~~ Systems

NOTES:

SERVICE VENDOR SELECTION CRITERIA

Mid-RANGE Systems

Criteria	Importance
Service Quality	9.1
System Availability	9.1
Technical Expertise	8.8
Response Time	8.5
Access to Spares	8.4

IMPORTANCE (0 2 4 6 8 10)

SERVICE VENDOR SELECTION CRITERIA

Mid-RANGE Systems

Software Support — 7.5
Vendor Reputation — 7.5
Price — 6.2
Contract Flexibility — 6.2
Ability to service other products — 4.3

IMPORTANCE (0, 2, 4, 6, 8, 10)

Service Contract Coverage
All ~~Small~~ Systems
Mid-Range

Contract Component	Sample Responding (Percent)	
Days of Coverage	*1988*	*1989*
Monday – Friday	~~66~~	*64*
Monday – Saturday	4	*3*
Monday – Sunday	30	*33*

INPUT

NOTES:

FPRB-38a

INPUT

23

Service Contract Coverage
All ~~Small~~ *Mid-Range* Systems

Contract Component	Sample Responding (Percent)	
Hours of Coverage	*1988*	*1989*
1–9 Hours	54	*56*
10–16 Hours	14	*13*
17–24 Hours	32	*31*

INPUT

NOTES:

FPRB-38b

INPUT

System Availability Analysis
All Small Systems

26

INPUT

27

~~Small~~ Systems System Availability
Mid-Range
1983-1988

97.5
97.4

System Availability (Percent)

- 94.5
- 93.8
- 92.3
- 96.2
- 96.9
- 97.9
- 96.9
- 96.7
- 96.9
- 93.6
- 90.5
- 96.1

98 · 96 · 94 · 92 · 90

'83 '84 '85 '86 '87 '88
Year

---- Receive ── Require

INPUT

NOTES:

FPRB-40

INPUT

EXHIBIT VI-6

**SYSTEM AVAILABILITY SATISFACTION
AT EACH REQUIREMENT LEVEL
ALL MID-RANGE SYSTEMS**

- Percent of Sample at Requirement Level
- Percent of Users Satisfied at the Requirement Level

EXHIBIT VI-7

**HARDWARE MAINTENANCE
REQUIRED VERSUS RECEIVED
ALL MID-RANGE SYSTEMS**

		Required		Received	
Key	Service	Mean	SE	Mean	SE
A	HW Engineer Skill	8.9	0.1	8.3	0.1
B	HW Remote Support	7.8	0.2	7.3	0.1
C	Spare Parts	8.8	0.1	8.1	0.1
D	HW Maintenance Overall	9.0	0.1	8.5	0.1

SE=Standard Error

ZNCC

49

System Interruption Analysis
All ~~Small~~ Systems
Mid-Range

System Interruptions (per Month)	~~12~~ .59
	Percent
Hardware Caused	~~56~~ 63
System Software Caused	~~15~~ 13
Applications Software Caused	~~8~~ 4
Other Caused (i.e., user-caused)	~~21~~ 20

INPUT

NOTES:

FPRB-42

INPUT

Key Service Requirements vs. Received
All Small Systems

Requirement

Mid-Range (handwritten)

Dissatisfied

Key Support Needs Continue to Go Unmet

Satisfied

Received

A=Overall HW Maintenance
B=Overall SW Support
C=Overall Planning Services
D=Spare Parts Availability
E=SW ~~Product Reliability~~ *Remote Support* (handwritten)
F=SW Documentation

HW Remote Support (handwritten)

INPUT

NOTES: *Replot*

	Required	Received
A HW Maint	9.8	8.5
B - SW support	8.5	7.5
C - HW Remote Support	7.8	7.3
D spare Parts Availability	8.8	8.1
E SW Remote Support	8.0	7.1
F SW Documentation	8.4	7.2

FPRB-43

INPUT

Mid-Range ~~Small~~ System User Satisfaction with High-Priority Services

Dissatisfied	Satisfied
Most Users Satisfied	HW Eng. Skill Level 60
	SW Support Overall 51
	HW Support Overall 54

100 75 50 25 0 25 50 75 100
Percent of Users

INPUT

NOTES:

HW Remote Support   63
HW Maint overall   59
SW Emg. Skill   57

FPRB-44a

~~Small~~ *Mid-Range* System User Satisfaction
with High-Priority Services

Dissatisfied	Satisfied

Most Users Satisfied	HW Eng. Skill Level	60
	SW Support Overall	51
	HW Support Overall	54

100 75 50 25 0 25 50 75 100
Percent of Users

INPUT

NOTES:

Sw Remote Support   55

Spares Availability   54

HW Engineering Skill 54

Sw Support overall   51

FPRB-44a

Mid-Range

~~Small~~ System User Satisfaction
with High-Priority Services

Dissatisfied	Satisfied

Most Users
Dissatisfied

53   SW Eng. Skill Level

34   Parts Availability

53   SW Documentation

100   75   50   25   0   25   50   75   100

Percent of Users

INPUT

NOTES:

FPRB-44b

INPUT

34

Systems Availability Performance—
Mid-Range ~~Small~~ Systems

Vendor	Sys. Avail. Received (Percent)	Percent Satisfied
DEC VAX 8XXX	96.5	93
AT&T	96.3	67
Concurrent	96.3	63
HP	97.1	63
Prime	95.8	62

INPUT

NOTES:

	Received	%
IBM 937X	97.5	74
Concurrent	97.8	73
Data General	96.8	73
Prime	97.4	68
IBM AS 400	98.0	67

FPRB-45

INPUT

Systems Availability Performance—
~~Small~~ *Mid-Range* Systems

Vendor	Sys. Avail. Received (Percent)	Percent Satisfied
IBM Sys/38	96.2	53
DG	97.0	50
DEC PDP	95.3	47
IBM 9370	94.6	45
Wang	95.5	31

INPUT

NOTES:

	Received	%
H P	96.9	65
AT+T	95.9	59
Tandem	99.0	43
DEC	97.1	39
Wang	98.4	3

FPRB-46

INPUT

36

Response Time Performance—
Mid-Range ~~Small~~ Systems

Vendor	Resp. Time Received (Percent)	Percent Satisfied 50 100
HP	3.4	96
Prime	2.6	94
IBM Sys/38	1.7	92
Concurrent	6.3	92
DEC VAX 8XXX	3.2	89

INPUT

NOTES:

	Received	%
Tandem	1.6	100
HP	4.1	95
Data General	7.1	92
Wang	4.9	92
~~IBM AS/400~~		
~~IBM 9XXX~~		
Concurrent	5.3	90

FPRB-47

INPUT

Response Time Performance—
~~Small~~ Mid-Range Systems

Vendor	Resp. Time Received (Percent)	Percent Satisfied
IBM 9370	1.7	86
DEC PDP	3.5	85
DG	3.6	81
AT&T	10.7	77
Wang	3.9	75

INPUT

Handwritten annotations:

Received

IBM AS400	1.0	89
IBM 937X	1.7	89
AT&T	11.3	85
DEC	2.1	85
Prime	2.2	83

NOTES:

FPRB-48

INPUT

Repair Time Performance—
~~Small~~ Systems
Mid-Range

Vendor	Repr. Time Received (Percent)	Percent Satisfied 50 100
Concurrent	4.7	97
HP	4.4	96
IBM 9370	3.1	96
DEC PDP	3.6	92
DEC VAX 8XXX	5.2	91

INPUT

NOTES:

	Received	*%*
Data General	4.1	97
Tandem	2.8	97
Wang	1.6	97
IBM AS 400	2.7	94
IBM 937X	2.9	93

FPRB-49

INPUT

39

Repair Time Performance—
MID-RANGE ~~Small~~ Systems

Vendor	Repr. Time Received (Percent)	Percent Satisfied
Prime	6.0	88
AT&T	7.6	87
IBM Sys/38	6.5	83
Wang	3.1	81
DG	3.2	71

INPUT

NOTES:

	Received	%
DEC	3.6	90
HP	1.9	88
Concurrent	8.4	84
AT&T	9.0	83
Prime	2.9	68

FPRB-50

INPUT

User Surveys

Third-Party Maintenance

INPUT

NOTES:

FPRB-51

INPUT

SERVICE VENDOR SELECTION CRITERIA

Third Party Maintainers

Criteria	Importance
Service Quality	9.2
Technical Expertise	8.7
System Availability	8.6
Response Time	8.3
Access to Spares	8.1

Importance

SERVICE VENDOR SELECTION CRITERIA
Third Party Maintainers

Criteria	Importance
Price	7.8
Vendor Reputation	7.6
Contract Flexibility	6.0
Ability to service other Products	5.9
Software support	4.5

Importance

TPM Contract Coverage— All Users

Service Coverage	Sample (Percent)	
Days of Coverage	*88*	*89*
Monday—Friday	71	*64*
Monday—Saturday	4	*2*
Monday—Sunday	25	*34*

INPUT

NOTES:

FPRB-52a

INPUT

44

TPM Contract Coverage— All Users

Service Coverage	Sample (Percent)	
Hours of Coverage	*88*	*89*
1—9 Hours	62	*53*
10—16 Hours	9	*12*
17—24 Hours	29	*35*

NOTES:

FPRB-52b

TPM System Availability Analysis— All Users

Component	Require	Receive	Percent Satisfied
System Availability (Percent)	~~95.9~~ 94.4	~~96~~ 95.9	67
Response Time (Hrs)	5.0 ~~4.8~~	3.9	91
Repair Time (Hrs)	7.8 ~~6.0~~	6.1	81

0   25   50   75   100

INPUT
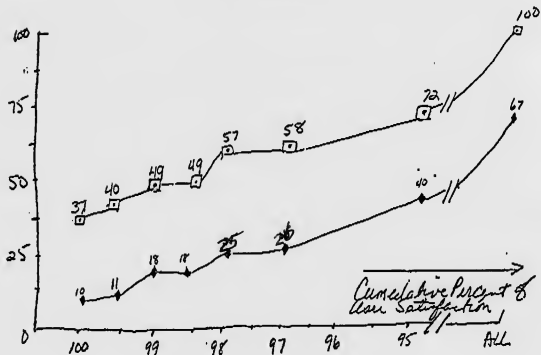
NOTES:

FPRB-53

46

TPM
System Availability Satisfaction
At Each Requirement Level
All Users.

System Availability
Requirement Level (Percent)

- ▫- Percent of Sample at Requirement Level
- ◆- Percent of Users Satisfied at the Requirement Level

TPM System Interruption Analysis—All Users

System Interruptions (per Month)	~~220~~ 1.2
	Percent
Hardware Caused	~~69~~ 66
System Software Caused	~~10~~ 9
Applications Software Caused	~~8~~ 5
Other (i.e., User Caused)	~~21~~ 20

INPUT

NOTES:

FPRB-55

INPUT

TPM Hardware Maintenance
Required vs. Received, All Users

A=Hardware Engineer Skill   C=Spare Parts Availability
B=Hardware Phone Support Staff   D=Overall Hardware
and Hardware Dispatch   Maintenance

NOTES: Replot

		Required	Received
A	Hardware Eng Skill	8.7	8.1
B	Hardware Remote Support	4.1	7.0
C.	Spare parts Availability	8.7	8.1
D.	overall HW Maintenance	9.0	8.5

FPRB-56

INPUT

50

TPM Hardware Maintenance Satisfaction— All Users

Service	Percent Satisfied

Spare Parts Availability ///////// 58

Overall Hardware Maintenance ////////// 62

0   50   100

INPUT

NOTES:

FPRB-57b

INPUT

5|

TPM Versus Manufacturer
System Availability Performance

Vendor Type	(Percent) Req.	Rec.	Percent Satisfied
TPM	97.3 ~~95.5~~	99.0 ~~98.7~~	85
MFR	97.8 ~~96.8~~	97.9 *or*	67
TPM	94.7 ~~86.7~~	95.5 ~~95.0~~	62
MFR	97.4 ~~98.3~~	97.3 ~~96.1~~	59

0   20   40   60   80   100

▨ Large System
▨ ~~Small~~ System
  Mid-Range
☐ *PC/WS*

INPUT

NOTES:

TPM 92.5 96.4   77%

MFC 94.0 95.7   73%

FPRB-58

INPUT

5v

User Satisfaction With Hardware Maintenance—
TPM Versus Manufacturer

Product Type	Percent Satisfied
Large System	78 / 76
Small Systems	65 / 54

☐ TPM
☐ Manufacturer

0   20   40   60   80   100

INPUT

NOTES:

PC/ws   68 %
         59 %

INPUT

53

User Satisfaction with Parts Availability
TPM Versus Manufacturer

Product Type	Percent Satisfied
Large System	TPM 56 / Manufacturer 60
Small System	TPM 49 / Manufacturer 46

☐ TPM
▨ Manufacturer

0 20 40 60 80 100

INPUT

NOTES:

PC/WS   67%   73%

FPRB-60

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INPUT

USER SURVEYS
PC/Workstations

INPUT

SERVICE VENDOR selection CRITERIA
PC/Workstation

55

Technical Expertise — 8.4
System Availability — 8.1
Response Time — 8.0
Access To Spares — 8.0
Vendor Reputation — 7.5

Importance

SERVICE VENDOR selection CRITERIA
PC/Workstation

56

Price — 6.9
service Quality — 6.6
contract Flexibility — 6.5
Software support — 5.9
Ability to service other Products — 5.4

2 4 6 8 10

Importance

Service Contract Coverage
~~fall these~~ PC/Workstations

	1989		1988	
	PER CENT OF SAMPLE	SE	PERCENT OR SAMPLE	SE
DAYS COVERED				
MONDAY - FRIDAY	76			
MONDAY - SATURDAY	1			
MONDAY - SUNDAY	23			
HOURS COVERED				
1 - 9 HOURS	75			
10 - 16	4			
16 - 24	21			

2

Service Contract Coverage

PC/Workstations

	1989 PERCENT OF SAMPLE	1988 PERCENT OF SAMPLE	SE
DAYS COVERED			
MONDAY - FRIDAY	76		
MONDAY - SATURDAY	1		
MONDAY - SUNDAY	23		
HOURS COVERED			
1 - 9 HOURS	75		
10 - 16	4		
16 - 24	21		

58

2

System Availability Analysis
PC / Workstations

Performance criteria	Received	Percent Satisfied
System Availability %	95.0	71
On-site Response Time (Hrs)	9.4	62
Onsite Repair Time (Hrs)	7.0	69
Depot Turnaround Time (Days)	3.8	71

PC/Workstations
System Availability Performance Analysis

	MFC	Dealers	TPM
System Availability (%)	95.7	95.0	94.5
Response Time (Hrs)	11.3	11.1	7.1
Repair Time (Hrs)	6.9	3.9	8.9
Depot Turnaround (days)	4.6	2.2	3.3

PC / Workstations
Satisfaction Levels
% Satisfied

	MFC	Dealer	TPM
System Avail	73	61	74
Response Time	53	76	61
Repair Time	67	72	68
HW Maint overall	59	73	68

62

PC Workstations
System Availability Satisfaction
At Each Requirement Level

System Availability
Requirement Level (Percent)

--□- Percent of Sample at Requirement Level
--◆- Percent of Users Satisfied at the Requirement Level

SYSTEM INTERRUPTION ANALYSIS

~~[crossed out]~~ PC/Workstations

	1989		1988	
	MEAN	SE	MEAN	SE
SYSTEM INTERRUPTIONS PER MONTH	1.3	0.2		
HARDWARE - CAUSED	77	2.9		
SYSTEM SOFTWARE - CAUSED	8	1.8		
APPLICATION SOFTWARE - CAUSED	5	1.4		
OTHER - CAUSED	10	2.1		

3

EXHIBIT -   64

~~HARDWARE~~ ~~MAINTENANCE~~
Key Service Requirements
~~REQUIRED~~ ~~VERSUS~~ ~~RECEIVED~~
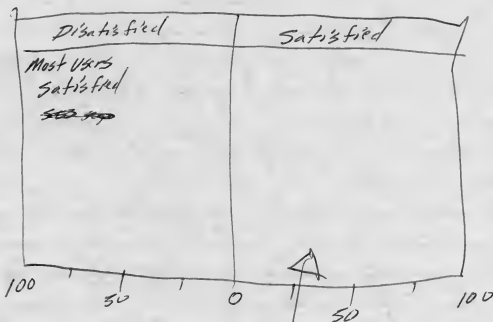~~the the~~ PC/Work Stations

Requirement

Received

Dissatisfied

Satisfied

Legend
at bottom
of chart

KEY	SERVICE	REQUIRED		RECEIVED	
		MEAN	SD	MEAN	SD
A	HW ENGINEER SKILL	8.5	0.1	7.9	0.1
B	HW REMOTE ~~Spare~~ Support Parts	8.6	0.1	8.0	0.2
C	~~SPARE PARTS~~ HotLine Support	6.4	0.3	6.5	0.1
D	HW MAINTENANCE OVERALL	8.9	0.1	8.2	0.1

USE
To Plot Histogram

6

PC/Workstation USER Satisfaction
with High Priority Services

Dissatisfied	Satisfied
Most Users Satisfied ~~SEB IOD~~	

100   50   0   50   100

Operational Training ~~Stt Support Over~~	70	Satisfied
Hotline Support	69	"
HW Maint overall	66	"
Spares Availability	65	"

PC/Workstation USER Satisfaction
with High Priority Services

Disatisfied	Satisfied
Most Users Satisfied	

100   50   0   50   100

HW Engineer Skill 64 Satisfied

SW Remote Support 52 Satisfied

PC/Workstation USER Satisfaction
with High Priority Services

Disatisfied	Satisfied
Most Users Dissatisfied	

100   50   0   50   100

SW Documentation 52% Dissatisfied

SW Engineer Skill 51% Dissatisfied

SW support overall 51% Dissatisfied

Systems Availability Performance
PC/Workstations

Vendor	System Avail. Received	Percent Satisfied 50 ——————— 100
Apollo (HP)	96.2	80%
Tandy	94.4	75%
IBM	93.7	73%
ALTOS	93.0	70%

INPUT

Notes:

Systems Availability Performance
PC/Workstations

Vendor	System Avail. Received	Percent Satisfied 50 100
Compaq	97.0	68%
Apple	94.6	68%
SUN	96.0	60%

INPUT

Notes: